IN THE CLAIMS

Please amend claim 4 as shown below. A complete listing of the claims is provided below.

1. (Previously Presented) A method of performing spatial processing in a wireless multiple-input multiple output (MIMO) communication system, comprising:

obtaining a plurality of channel response matrices for a channel response of a MIMO channel in the MIMO system;

computing a correlation matrix for the MIMO channel based on the plurality of channel response matrices; and

decomposing the correlation matrix to obtain at least one steering vector for at least one spatial channel of the MIMO channel, wherein the at least one steering vector is used by a transmitting entity for frequency-independent spatial processing of a data stream sent on the at least one spatial channel associated with the at least one steering vector.

2. (Previously Presented) The method of claim 1, wherein the plurality of channel response matrices comprise a plurality of channel impulse response matrices for a plurality of time delays of a channel impulse response of the MIMO channel.

3. (Previously Presented) The method of claim 1, wherein the plurality of channel response matrices comprise a plurality of channel frequency response matrices for a channel frequency response for a plurality of subbands of the MIMO channel.

4. (Currently Amended) The method of claim 1, wherein the computing [[of]] the correlation matrix for the MIMO channel includes:

computing a correlation matrix of each of the plurality of channel response matrices to obtain a plurality of correlation matrices for the plurality of channel response matrices, and

summing the plurality of correlation matrices for the plurality of channel response matrices to obtain the correlation matrix for the MIMO channel.

5. (Previously Presented) The method of claim 2, wherein the computing the correlation matrix fir the MIMO channel includes:

determining energy of each of the plurality of channel impulse response matrices, identifying a channel impulse response matrix with highest energy among the plurality of channel impulse response matrices, and

computing a correlation matrix of the channel impulse response matrix with the highest energy to generate the correlation matrix for the MIMO channel.

6. (Previously Presented) The method of claim 1, wherein eigenvalue decomposition of the correlation matrix is performed to obtain the at least one steering vector for the at least one spatial channel of the MIMO channel.

7. (Previously Presented) The method of claim 1, further comprising:

sending the at least one steering vector as feedback information to the transmitting entity.

8. (Previously Presented) The method of claim 1, wherein the at least one steering vector is used by the transmitting entity to generate a plurality of transmit chip streams for at least one data stream sent on the at least one spatial channel of the MIMO channel, and wherein the plurality of transmit chip streams are transmitted from a plurality of transmit antennas at the transmitting entity.

9. (Previously Presented) The method of claim 1, wherein the frequency-independent spatial processing is performed by the transmitting entity in the time-domain on a stream of time-domain chips generated for the data stream by OFDM modulation.

10. (Previously Presented) The method of claim 1, wherein the frequency-independent spatial processing is performed by the transmitting entity in the frequency-domain for each of a plurality of subbands on data symbols generated for the data stream.

11. (Previously Presented) The method of claim 1, further comprising:

obtaining, from the plurality of channel response matrices, a plurality of channel response vectors for each of a plurality of receive antennas at a receiving entity; and

deriving a matched filter for each of the plurality of receive antennas based on the at least one steering vector and the plurality of channel response vectors for the respective receive antenna.

12. (Previously Presented) The method of claim 11, wherein the matched filter for each of the plurality of receive antennas is used to maximize received signal-to-noise ratio (SNR) for the respective receive antenna.

13. (Previously Presented) The method of claim 11, further comprising: filtering a plurality of received symbol streams for the plurality of receive antennas with the plurality of matched filters.

14. (Previously Presented) The method of claim 13, wherein the plurality of channel response matrices comprise a plurality of channel impulse response matrices for a plurality of time delays of a channel impulse response of the MIMO channel, and wherein the filtering is performed in the time domain with a plurality of time-domain matched filters derived for the plurality of receive antennas based on the at least one steering vector and the plurality of channel impulse response matrices.

15. (Previously Presented) The method of claim 13, wherein the plurality of channel response matrices comprise a plurality of channel frequency response matrices for a channel frequency response for a plurality of subbands of the MIMO channel, and wherein the filtering is performed in the frequency domain with a plurality of frequency-domain matched filters derived for the plurality of receive antennas based on the at least one steering vector and the plurality of channel frequency response matrices.

16. (Previously Presented) The method of claim 1, wherein one steering vector is obtained and used by the transmitting entity for frequency-independent spatial processing of one data stream.

17. (Previously Presented) The method of claim 16, further comprising:

deriving a matched filter for each of a plurality of receive antennas at a receiving entity based on the one steering vector and a plurality of channel response vectors for the receive antenna, wherein the plurality of channel response vectors for each receive antenna are obtained from the plurality of channel response matrices,

filtering a plurality of received symbol streams for the plurality of receive antennas with the plurality of matched filters to obtain a plurality of filtered symbol streams; and

combining the plurality of filtered symbol streams to obtain a detected symbol stream for the one data stream sent by the transmitting entity.

18. (Previously Presented) The method of claim 17, further comprising:

performing equalization on the detected symbol stream to obtain a recovered symbol stream for the one data stream.

19. (Previously Presented) The method of claim 1, wherein a plurality of steering vectors are obtained and used by the transmitting entity for frequency-independent spatial processing of a plurality of data streams sent on a plurality of spatial channels associated with the plurality of steering vectors.

20. (Previously Presented) The method of claim 19, further comprising:

deriving a matched filter for each of a plurality of receive antennas at a receiving entity based on the plurality of steering vectors and a plurality of channel response vectors for the receive antenna, wherein the plurality of channel response vectors for each receive antenna are obtained from the plurality of channel response matrices,

filtering a plurality of received symbol streams for the plurality of receive antennas with the plurality of matched filters to obtain a plurality of filtered symbol substreams; and

combining the plurality of filtered symbol substreams to obtain a plurality of detected symbol streams for the plurality of data streams sent by the transmitting entity.

21. (Previously Presented) The method of claim 20, further comprising:

performing space-time equalization for the plurality of detected symbol streams to obtain a plurality of recovered symbol streams for the plurality of data streams.

22. (Previously Presented) The method of claim 21, wherein the space-time equalization is performed with a minimum mean square error linear equalizer (MMSE-LE), a decision feedback equalizer (DFE), or a maximum likelihood sequence estimator (MLSE).

23. (Previously Presented) An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

a channel estimator to obtain a plurality of channel response matrices for a channel response of a MIMO channel in a MIMO system; and

a controller to compute a correlation matrix for the MIMO channel based on the plurality of channel response matrices and to decompose the correlation matrix to obtain at least one steering vector for at least one spatial channel of the MIMO channel, wherein the at least one steering vector is used by a transmitting entity for frequency-independent

spatial processing of a data stream sent on the at least spatial channel associated with the at least one steering vector.

24. (Previously Presented) The apparatus of claim 23, wherein the controller computes a correlation matrix of each of the plurality of channel response matrices to obtain a plurality of correlation matrices for the plurality of channel response matrices, and to sum the plurality of correlation matrices to obtain the correlation matrix for the MIMO channel.

25. (Previously Presented) The apparatus of claim 23, wherein the plurality of channel response matrices comprise a plurality of channel impulse response matrices for a plurality of time delays of a channel impulse response of the MIMO channel, and wherein the controller determines energy of each of the plurality of channel impulse response matrices and computes a correlation matrix of a channel impulse response matrix with highest energy among the plurality of channel impulse response matrices to obtain.

26. (Previously Presented) The apparatus of claim 23, further comprising:

a plurality of matched filters for a plurality of receive antennas, one matched filter for each receive antenna, each matched filter is used to filter a received symbol stream for an associated receive antenna to obtain a filtered symbol stream, wherein the matched filter for each receive antenna is derived based on the at least one steering vector and a plurality of channel response vectors for the receive antenna, and wherein the plurality of channel response vectors for each receive antenna are obtained from the plurality of channel response matrices; and

a combiner to combine a plurality of filtered symbol streams from the plurality of matched filters to obtain at least one detected symbol stream for at least one data stream sent by the transmitting entity.

27. (Previously Presented) An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

means for obtaining a plurality of channel response matrices for a channel response of a MIMO channel in the MIMO system;

means for computing a correlation matrix for the MIMO channel based on the plurality of channel response matrices; and

means for decomposing the correlation matrix to obtain at least one steering vector for at least one spatial channel of the MIMO channel, wherein the at least one steering vector is used by a transmitting entity for frequency-independent spatial processing of a data stream sent on the at least one spatial channel associated with the at least one steering vector.

28. (Previously Presented) The apparatus of claim 27, wherein the means for computing the correlation matrix includes:

means for computing a correlation matrix of each of the plurality of channel response matrices to obtain a plurality of correlation matrices for the plurality of channel response matrices, and

means for summing the plurality of correlation matrices to obtain the correlation matrix for the MIMO channel.

29. (Previously Presented) The apparatus of claim 27, wherein the plurality of channel response matrices comprise a plurality of channel impulse response matrices for a plurality of time delays of a channel impulse response of the MIMO channel.

30. (Previously Presented) The apparatus of claim 29, wherein the means for computing the correlation matrix includes:

means for determining energy of each of the plurality of channel impulse response matrices, and

means for computing a correlation matrix of a channel impulse response matrix with highest energy among the plurality of channel impulse response matrices to obtain the correlation matrix for the MIMO channel.

31. (Previously Presented) A processor readable media for storing instructions operable to:

receive a plurality of channel response matrices for a channel response of a multiple-input multiple-output (MIMO) channel in a MIMO system;

compute a correlation matrix for the MIMO channel based on the plurality of channel response matrices; and

decompose the correlation matrix to obtain at least one steering vector for at least one spatial channel of the MIMO channel, wherein the at least one steering vector is used by a transmitting entity for frequency-independent spatial processing of a data stream sent on the at least one spatial channel associated with the at least one steering vector.

32. (Previously Presented) The processor readable media of claim 31 and further storing instructions operable to:

compute a correlation matrix of each of the plurality of channel response matrices to obtain a plurality of correlation matrices for the plurality of channel response matrices; and

sum the plurality of correlation matrices to obtain the correlation matrix for the MIMO channel.

33. (Previously Presented) The processor readable media of claim 31, wherein the plurality of channel response matrices comprise a plurality of channel impulse response matrices for a plurality of time delays of a channel impulse response of the MIMO channel.

34. (Previously Presented) The processor readable media of claim 33, and further storing instructions operable to:

compute energy of each of the plurality of channel impulse response matrices; and

compute a correlation matrix of a channel impulse response matrix with highest energy among the plurality of channel impulse response matrices to obtain the correlation matrix for the MIMO channel.

35. (Previously Presented) A method of performing spatial processing in a multiple-input multiple-output (MIMO) communication system, comprising:

obtaining a plurality of channel impulse response matrices for a MIMO channel in the MIMO system, wherein the plurality of channel impulse response matrices comprise a plurality of time delays of a channel impulse response of the MIMO channel;

computing energy of each of the plurality of channel impulse response matrices;

identifying a channel impulse response matrix with highest energy among the plurality of channel impulse response matrices as a channel impulse response matrix for a main path of the MIMO channel;

computing a correlation matrix of the channel impulse response matrix for the main path; and

decomposing the correlation matrix to obtain a steering vector for a spatial channel of the main path, wherein the steering vector is used by a transmitting entity for frequency-independent spatial processing of a data stream sent via the MIMO channel.

36. (Previously Presented) The method of claim 35, wherein eigenvalue decomposition of the correlation matrix for the main path is performed to obtain the steering vector for the spatial channel of the main path.

37. (Previously Presented) The method of claim 35, further comprising:

deriving a matched filter for each of a plurality of receive antennas at a receiving entity based on the steering vector and a plurality of channel impulse response vectors for the receive antenna, wherein the plurality of channel impulse response vectors for each receive antenna are obtained from the plurality of channel impulse response matrices; and

filtering a plurality of received symbol streams for the plurality of receive antennas with the plurality of matched filters.

38. (Previously Presented) A method of performing spatial processing in a wireless communication system with a plurality of transmit antennas at a transmitting entity and a plurality of receive antennas at a receiving entity, the method comprising:

obtaining a plurality of sets of channel response vectors for the plurality of receive antennas, one set for each receive antenna, wherein each set of channel response vectors is indicative of a channel response between the plurality of transmit antennas and one of the plurality of receive antennas;

computing a correlation matrix for each of the plurality of receive antennas based on the set of channel response vectors for the receive antenna; and

decomposing the correlation matrix for each receive antenna to obtain a steering vector for the receive antenna, wherein a plurality of steering vectors are obtained for the plurality of receive antennas and the plurality of steering vectors are used by the transmitting entity for frequency-independent spatial processing of at least one data stream sent to the receiving entity.

39. (Previously Presented) The method of claim 38, wherein the computing the correlation matrix for each receive antenna includes:

computing a correlation matrix of each of the plurality of channel response vectors for the receive antenna to obtain a plurality of correlation matrices for the plurality of channel response vectors for the receive antenna, and

summing the plurality of correlation matrices for the plurality of channel response vectors for the receive antenna to obtain the correlation matrix for the receive antenna.

40. (Previously Presented) The method of claim 38, further comprising:

deriving a matched filter for each of the plurality of receive antennas based on the steering vector and the set of channel response vectors for the receive antenna;

filtering a received symbol stream for each of the plurality of receive antennas with the matched filter for the receive antenna to obtain a filtered symbol stream for the receive antenna; and

combining a plurality of filtered symbol streams for the plurality of receive antennas to obtain at least one detected symbol stream for the at least one data stream sent by the transmitting entity.

41. (Previously Presented) The method of claim 38, wherein one data stream is sent by the transmitting entity to the plurality of receive antennas using the plurality of steering vectors.

42. (Previously Presented) The method of claim 38, wherein a plurality of data streams are sent by the transmitting entity to the plurality of receive antennas using the plurality of steering vectors.

43. (Previously Presented) The method of claim 42, further comprising:

deriving a matched filter for each of the plurality of receive antennas based on the steering vector and the plurality of channel response vectors for the receive antenna, wherein a plurality of matched filters are derived for the plurality of receive antennas;

filtering a plurality of received symbol streams for the plurality of receive antennas with the plurality of matched filters to obtain a plurality of filtered symbol streams; and

combining the plurality of filtered symbol streams to obtain a plurality of detected symbol streams for the plurality of data streams sent by the transmitting entity.

44. (Previously Presented) The method of claim 43, further comprising:

performing space-time equalization on the plurality of detected symbol streams to obtain a plurality of recovered symbol streams for the plurality of data streams.

45. (Previously Presented) An apparatus in a wireless communication system with a plurality of transmit antennas at a transmitting entity and a plurality of receive antennas at a receiving entity, the apparatus comprising:

a channel estimator to obtain a plurality of sets of channel response vectors for the plurality of receive antennas, one set for each receive antenna, wherein each set of channel response vectors is indicative of a channel response between the plurality of transmit antennas and one of the plurality of receive antennas; and

a controller to compute a correlation matrix for each of the plurality of receive antennas based on the set of channel response vectors for the receive antenna and to decompose the single correlation matrix for each receive antenna to obtain a steering vector for the receive antenna, wherein a plurality of steering vectors are obtained for the plurality of receive antennas and the plurality of steering vectors are used by the transmitting entity for frequency-independent spatial processing of at least one data stream sent to the receiving entity.

46. (Previously Presented) The apparatus of claim 45, wherein the controller computes a correlation matrix of each of the plurality of channel response vectors for each receive antenna to obtain a plurality of correlation matrices for the plurality of channel response vectors for the receive antenna and to sum the plurality of correlation matrices for the plurality of channel response vectors for the receive antenna to obtain the correlation matrix for the respective receive antenna.

47. (Previously Presented) The apparatus of claim 45, wherein the controller derives a matched filter for each of the plurality of receive antennas based on the steering vector and the set of channel response vectors for the respective receive antenna.

48. (Previously Presented) The apparatus of claim 47, further comprising:

a plurality of matched filters for the plurality of receive antennas, one matched filter for each receive antenna, each matched filter is used to filter a received symbol stream for the associated receive antenna to obtain a filtered symbol stream; and

a combiner to combine a plurality of filtered symbol streams from the plurality of matched filters to obtain at least one detected symbol stream for the at least one data stream sent by the transmitting entity.

49. (Previously Presented) An apparatus in a wireless communication system, comprising:

means for obtaining a plurality of sets of channel response vectors for a plurality of receive antennas, one set for each receive antenna, wherein each set of channel response vectors is indicative of a channel response between a plurality of transmit antennas and one of the plurality of receive antennas;

means for computing a correlation matrix for each of the plurality of receive antennas based on the set of channel response vectors for the respective receive antenna; and

means for decomposing the single correlation matrix for each receive antenna to obtain a steering vector for the respective receive antenna, wherein a plurality of steering vectors are obtained for the plurality of receive antennas and are used by a transmitting entity for frequency-independent spatial processing of at least one data stream sent to a receiving entity.

50. (Previously Presented) The apparatus of claim 49, further comprising:

means for computing a correlation matrix of each of the plurality of channel response vectors for each receive antenna to obtain a plurality of correlation matrices for the plurality of channel response vectors for the receive antenna, and

means for summing the plurality of correlation matrices for the plurality of channel response vectors for each receive antenna to obtain the correlation matrix for the respective receive antenna.

51. (Previously Presented) The apparatus of claim 49, further comprising:

means for deriving a matched filter for each of the plurality of receive antennas based on the steering vector and the set of channel response vectors for the respective receive antenna;

means for filtering a received symbol stream for each of the plurality of receive antennas with the matched filter for the receive antenna to obtain a filtered symbol stream for the respective receive antenna; and

means for combining a plurality of filtered symbol streams for the plurality of receive antennas to obtain at least one detected symbol stream for the at least one data stream sent by the transmitting entity.

52. (Previously Presented) A computer-readable media for storing instructions operable to:

receive a plurality of sets of channel response vectors for a plurality of receive antennas, one set for each receive antenna, wherein each set of channel response vectors is indicative of a channel response between a plurality of transmit antennas and one of the plurality of receive antennas;

compute a correlation matrix for each of the plurality of receive antennas based on the set of channel response vectors for the respective receive antenna; and

decompose the correlation matrix for each receive antenna to obtain a steering vector for the respective receive antenna, wherein a plurality of steering vectors are obtained for the plurality of receive antenna and are used by a transmitting entity for frequency-independent spatial processing of at least one data stream sent to a receiving entity.

53. (Previously Presented) The processor readable media of claim 52 and further storing instructions operable to:

compute a correlation matrix of each of the plurality of channel response vectors for each receive antenna to obtain a plurality of correlation matrices for the plurality of channel response vectors for the respective receive antenna; and

sum the plurality of correlation matrices for the plurality of channel response vectors for each receive antenna to obtain the correlation matrix for the respective receive antenna.

54. (Previously Presented) The processor readable media of claim 52 and further storing instructions operable to:

derive a matched filter for each of the plurality of receive antennas based on the steering vector and the set of channel response vectors for the respective receive antenna;

filter a received symbol stream for each of the plurality of receive antennas with the matched filter for the receive antenna to obtain a filtered symbol stream for the respective receive antenna; and

combine a plurality of filtered symbol streams for the plurality of receive antennas to obtain at least one detected symbol stream for the at least one data stream sent by the transmitting entity.

55. (Previously Presented) A method of performing spatial processing in a multiple-input single-output (MISO) system utilizing orthogonal frequency division multiplexing (OFDM), the method comprising:

obtaining a set of channel response vectors indicative of a channel response between a plurality of transmit antennas at a transmitting entity and a receive antenna at a receiving entity in the MISO system;

computing a correlation matrix based on the set of channel response vectors; and

decomposing the correlation matrix to obtain a steering vector used by the transmitting entity for frequency-independent spatial processing of a data stream sent to the receiving entity.

56. (Previously Presented) The method of claim 55, wherein the frequency-independent spatial processing is performed by the transmitting entity in the time-domain on a stream of time-domain chips generated for the data stream by OFDM modulation.

57. (Previously Presented) The method of claim 55, wherein the frequency-independent spatial processing is performed by the transmitting entity in the frequency-domain for each of a plurality of subbands on data symbols generated for the data stream.

58. (Previously Presented) The method of claim 55, further comprising:

deriving a matched filter based on the steering vector and the set of channel response vectors; and

filtering a received symbol stream with the matched filter to obtain a detected symbol stream.